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SAFETY CODES FOR DUST EXPLOSION PREVENTION

A radio talk by Hylton R. Brown, Bureau of Chemistry and Soils, delivered through radio station WRC and 43 other associate NBC stations, in the National Farm and Home Hour, Tuesday, October 20, 1931.

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DEPARTMENT OF AGRICULTURE

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This morning 33 men gathered in Washington for the fall meeting of the Dust Explosion Hazards Committee of the National Fire Protection Association. Each man represents some industry interested in dust explosion prevention, such as grain handling, flour and feed milling, starch manufacturing and similar lines of work in which a dust explosion hazard exists. This committee, working under the leadership of the Department of Agriculture, has the task of translating the scientific research work of the laboratories into practical codes or requirements for the safe operation of industrial plants.

Since scientists first discovered that dust particles in suspension in air could be ignited and produce an explosion similar to a gas explosion, other scientists have tried to develop methods of overcoming this hazard. We now know that disastrous dust explosions can occur in any industrial plant where combustible dusts are created during the operating process. The Chemical Engineering Division of the Bureau of Chemistry and Soils in the U. S. Department of Agriculture is constantly conducting investigations to determine the exact course and nature of such explosions.

The Chemical Engineering Division makes results of these investigations available to the Dust Explosion Hazards Committee and through them to the industry in the form of codes or regulations for the prevention of dust explosions. Such codes have been prepared for flour and feed mills, terminal grain elevators, and starch factories. There are also codes for sugar and cocoa pulverizing plants, pulverized fuel installations, wood flour manufacturing establishments, spice grinding plants, and coal pneumatic cleaning plants. Hard rubber grinding, sulphur pulverizing, and the production of metallic dusts are still being studied and we are giving special attention to the preparation of a code for country grain elevators.

There are approximately 4000 farmers' elevator associations in the United States, and the value of the plants through which they handle their grain is placed at \$65,000,000. It is estimated that these associations handle annually 550,000,000 bushels of grain. Many of their small elevators are built along the railroad or in a small settlement. Their isolated locations make them a serious fire hazard. This is due both to the nature of the business and to the fact that available fire-fighting facilities are, as a rule, totally inadequate to cope with a fire in such a large building.

An analysis of fire losses in country elevators shows that practically all are preventable. It is a case where precaution, care, and attention to fire prevention practices by the elevator operator are of greater value than fire-fighting equipment. Frequently when a fire starts in a plant of this kind, a dust explosion quickly follows and the flames are carried to all parts of the building. Before any real fire fighting can be done the structure and its contents are a total loss. It is for this reason that the Dust Explosion Hazards Committee, assembled here today, plans to give special attention to the reduction of fire and dust explosion hazards in country grain elevators.

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There are a number of generally recognized precautions against fire which should be made a part of the operating regulations of every cooperative or country grain elevator. First, it is necessary to obtain a reliable manager, one who will take an active interest in fire protection, and then cooperate with him in eliminating the hazards usually found in such plants.

Require a thorough inspection of the plant before closing at night.

Provide sufficient help so that the care and repair of machinery are not neglected during the rush periods.

Hot bearings are responsible for many fires. Make special efforts to eliminate this source of trouble.

Stones, scrap iron, shotgun shells, matches, and other material capable of starting a fire in machinery have been found in grain brought to country elevators. Provide screens to catch this material before it enters the house.

Strictly prohibit smoking or the use of open lights around the plant.

Lightning is a frequent cause of fires in country elevators. To guard against this hazard properly equip all buildings with lightning rods.

Keep both the building and the surrounding land clean and free from accumulations of dust and rubbish which would cause the rapid spreading of a fire.

Place fire extinguishers and water barrels at convenient points about the plant and install a loud alarm or some other means for calling assistance in case a small fire occurs. A small fire in a country elevator, if not checked promptly, is soon beyond control.

I wish you could be with us this afternoon. We plan to take the members of the Dust Explosion Hazards Committee and their guests to the Department of Agriculture's experimental farm at Arlington, Virginia, where the Chemical Engineering Division has erected some equipment in which dust explosions can actually be produced for demonstration purposes. Engineers working on this problem have found that dust explosion pressures can be released through properly proportioned vents or hinged windows without doing any great damage to the structure in which they occur. The equipment used at Arlington consists of a box or room connected to a gallery or tunnel, which in turn connects with a tower. When these three units, with a total volume of 333 cubic feet, are filled with a cloud of grain dust and the dust is ignited, a terrific explosion occurs. However, if enough windows or vents in the sides of the box, gallery, and tower have been opened before the ignition occurs, the pressure and flame are quickly released without doing any damage.

It is expected that through additional tests with this equipment the size of opening or vent necessary to release dust explosion pressures can be determined for many explosive dusts and this information will be incorporated in the safety codes which the committee is preparing for the prevention of dust explosions in industrial plants.